ORDER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

8000.40D

12/26/95

SUBJ: MAINTENANCE OF PRESSURE CYLINDERS IN USE AS AIRCRAFT EQUIPMENT

1 PURPOSE. This order establishes maintenance procedures used to ensure the integrity of pressure cylinders that serve as aircraft equipment in operations under Title 14 Code of Federal Regulations (CFR) parts 91, 121, 125, 127, and 135.

2. DISTRIBUTION. This order is distributed to the branch level in the Flight Standards, and Aircraft Certification Services, and the Office of Aviation System Standards; to the Flight Standards Branch at the FAA Academy; to the branch level in the regional Flight Standards and Aircraft Certification Divisions; to all Flight Standards District Offices; to all Aircraft Certification Offices; to all International Aviation Field Offices; and to all Aircraft Evaluation Groups.

3 CANCELLATION. Order 8000.40C, Maintenance of Pressure Cylinders in Use as Aircraft Equipment, dated May 29, 1992, is cancelled.

4. BACKGROUND.

a. The development of Department of Transportation (DOT) Regulations (Title 49 CFR parts 100-199) pertaining to the transportation of dangerous articles and magnetized materials by aircraft was based on the applicable regulations of the Interstate Commerce Commission. Initially, the transportation of dangerous articles was prohibited in scheduled air transportation. Regulatory efforts, diverted toward the transportation of dangerous articles, gave little attention to similar, dangerous articles used aboard aircraft as part of a system as required equipment. An example is the lack of specific Federal Aviation Regulations (FAR) for prescribing airworthiness standards of pressure cylinders for a variety of applications, including oxygen, fire extinguishers, and emergency air cylinders that are part of life support systems. Effective May 29, 1992, the Federal Aviation Administration (FAA) established a phase-in program to remove from service those cylinders for which hydrostatic tests are overdue.

Distribution: A-W(FS/IR/VN)-3; AMA-200 (80 cys); A-X(FS/CD)-3; A-FFS-7 (MAX); A-FAC-0 (MAX); A-FIA-0(STD); A-FFS-10 (STD); AIR-200 (1 cy); AFS-600 (5 cys)

Initiated By: AFS-350

b. Approval of pressure cylinders for use aboard aircraft is accomplished during type certification in accordance with Title 14 CFR part 21; this includes foreign-manufactured cylinders. Pressure cylinders may be approved in conjunction with type certification procedures or in any other manner approved by the Administrator.

(1) The approval standards used are those established by DOT, Research and Special Programs Administration (RSPA), U.S. Coast Guard (USCG), Underwriters Laboratory (UL), pressure cylinder manufacturers, and military specifications (MIL-SPEC).

c. There are no specific requirements in the FAR for certification, manufacture, and maintenance of pressure cylinders used aboard aircraft. Title 14 CFR section 21.305, however, has a general provision that allows approval in any manner approved by the Administrator. Under this provision, pressure cylinders have been approved by utilizing the requirements of DOT, RSPA, USCG, UL, manufacturers, and the military.

d Title 14 CFR parts 91, 121, 125, 127, and 135 do not prescribe rules pertaining to the inspection and test of pressure cylinders used aboard aircraft. However, when approved by the Administrator, the provisions of operations specifications (OpSpecs) and inspection programs are considered rules that require precisely the same consideration as the FAR. In exercising this authority, the Administrator has adopted, in the interest of safety, the rules and regulations of DOT, RSPA, USCG, UL, MIL-SPEC, and applicable manufacturers as acceptable methods for controlling the hydrostatic tests and life limits of pressure cylinders through OpSpecs and inspection programs.

e. Recognizing the lack of specific FAA test data necessary to consider cylinder aging, internal corrosion, external pressure changes, cycles, and extreme temperature changes, it is logical to accept those standards developed by DOT, RSPA, and other experts for maintaining the integrity of pressure cylinders. It follows that pressure cylinders used aboard aircraft should be maintained under the same specifications prescribed by the appropriate regulatory agency and manufacturers if no other requirements are available.

5 PROCEDURES. Principal maintenance inspectors shall ensure that the inspection, retest, and life limit requirements for pressure cylinders used as aircraft equipment are, at a minimum, those set forth by the appropriate specification requirement under which the cylinder wasmanufactured. These requirements shall be shown in the appropriate automated OpSpecs paragraph and included in the inspection programs required by Title 14 CFR, Part 91 section 91.409. Throughout this order, the term "OpSpecs" shall mean FAA Form 8400-8, Operations Specifications, or other approved controlling documents. Such controlling documents must be clearly identified and made part of the OpSpecs by an appropriate reference in an automated OpSpecs paragraph.

6. GUIDANCE AND USE IN THE PREPARATION OF OPSPECS. The intention is not to have all pressure cylinders listed on one page. Various cylinders in use will be listed in the approved, automated OpSpecs paragraph. Pressure cylinder hydrostatic tests and life limits are listed in the appropriate OpSpecs paragraph D71 (see appendix 1). The cylinders installed as aircraft equipment will be maintained as follows:

a. DOT specification cylinders including spheres must be inspected and tested as required by Title 49 CFR, Part 173 section 173.34.

b Cylinders including spheres manufactured under an exemption issued by RSPA must be inspected and tested as required by the terms of the exemption.

c. All other cylinders including spheres must be inspected and tested. as required by subparagraph a. above as it applies to DOT 3HT cylinders, unless alternative testing and inspection procedures are specified by the manufacturer or referenced authority.

d. Operators with scheduled heavy maintenance checks that are accomplished in phases or segments are required to have a procedure in place to check cylinders during that phase or segment of their heavy maintenance checks in which maintenance of high pressure cylinders would normally occur. It is not necessary to accomplish cylinder maintenance for stand-alone systems, e.g., fire suppression systems, at any more than one such phase or segment of a heavy maintenance cycle. Cylinders installed as a part of a system, e.g. emergency evacuation equipment, should receive maintenance concurrent with the scheduled maintenance for the system in which they are installed. *

e. Pressure cylinders installed as aircraft equipment may remain in service beyond their hydrostatic test due date until the next scheduled heavy maintenance check or annual inspection. Cylinders which have reached their hydrostatic test due date cannot be recharged or installed until hydrostatically tested. Operators will be required:

(1) To establish a phase-in program to remove cylinders for which hydrostatic tests are overdue. By the end of the phase-in period (not to exceed 5 years from the effective date of May 29, 1992), all installed cylinders will be within hydrostatic test due date requirements.

(2) To have a procedure in place after the phase-in period to check cylinders during scheduled heavy maintenance, and to remove them when hydrostatic test dates have expired.

7. INFORMATION UPDATE. Any deficiencies found, clarifications needed, or suggested improvements regarding the contents of this order should be noted on FAA Form 1320-19, Directive Feedback Information. For your convenience, this form is included at the end of this order. Your comments should be forwarded to the originating office (Attn: Directives Management Officer), for consideration. If an interpretation is needed immediately, you may call the originating office for guidance. However, you should also use the FAA Form 1320-19 as a followup to the verbal conversation.

William J. White
Deputy Director, Flight Standards Service

U.S. Department of Transportation Federal Aviation Administration

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D71. ADDITIONAL MAINTENANCE REQUIREMENTS (10/05/90)

The aircraft identified below shall not be used in 14 CFR part 135 operations unless the following additional maintenance requirements of 14 CFR section 135.421 are met:

AIRCRAFT MAKE AND MODEL (9 OR LESS)	
PIPER PA	600
PIPER	31T
CESSNA	T207a
CESSNA	T21ON
BELL	206B

a. Each installed engine, its component parts and accessories necessary for its function shall be maintained in an airworthy condition in accordance with the following maintenance documents. The engine, its component parts and accessories shall be overhauled on or before the time-in-service interval shown in Table 1.

Table 1

ENGINE MAKE AND MODEL	MAINTENANCE DOCUMENT	TIME-IN-SERVICE INTERVAL
LYC I0540KIJB	PIPER SERVICE MANUAL 761732	2,000 Hours
P&W PT6A-28	PIPER SERVICE MANUAL 761-664 TREND MONITORING I.A.W S/B 1003	H.S.I. -O.C.
	P&W OHL MANUAL 301-3243	3,500 HOURS
CONT TS10-520M	CESNNA SERVICE MANUAL D2060-13	1,500 HOURS
CONT TSI0-52OR	CESSNA SERVICE MANUAL D2035-13	1,500 HOURS
ALLISON C	BELL SERVICE MANUAL	

b. Each installed propeller and propeller control shall be maintained in an airworthy condition in accordance with the schedule of maintenance in the following maintenance documents. The propeller and propeller control shall be overhauled on or before the time-in-service interval show in Table 2

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TABLE 2

PROPELLER/ GOVERNOR MAKE AND MODEL	MAINTENANCE DOCUMENT.	TIME&IN-SERVICE INTERVAL HOURS/CALENDAR
(P) MCCAULEY D3A4C4OW (G)MCCAULEY C16032-1010	CESSNA SERVICE MANUAL DO2058-1-13	1600 HRS/5 YRS WHICHEVER COMES FIRST 1600 HOURS
(P) MCCAULEY 2A34C203 (G) MCCAULEY C290D3/T15	CESSNA SERVICE MANUAL D2027-13	1500 HOURS/5 YRS WHICHEVER COMES FIRST 1800 HOURS

c. Each rotor installed on the helicopter listed in Table 3 is maintained in an airworthy condition in accordance with the schedule of maintenance functions in the following operator's maintenance documents.

TABLE 3

HELICOPTER MAKE AND MODEL	MAINTENANCE DOCUMENT
BELL 206B	PAN AMERICAN AIRLINES INC. INSPECTION DOCUMENT AAIP-2-2099, DATED 03/21/90

d. Each item of installed emergency equipment listed in Table 4 is maintained in an airworthy condition in accordance with the schedule of maintenance and inspection functions in the following maintenance documents.

TABLE 4

EMERGENCY EQUIPMENT ITEM	MAINTENANCE DOCUMENT
OXYGEN REGULATOR	PIPER SERVICE MANUAL 761732
* OXYGEN BOTTLE	
** EXTINGUISHER HALON 1211	PLACARD INSTRUCTIONS
LIFE VESTS	OPERATOR'S OR MANUFACTURER DOCUMENT
PYROTECHNIC SIGNAL DEVICE	OPERATOR'S OR MANUFACTURER DOCUMENT

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e. * Inspections, hydrostatic tests, and life limits of pressure vessels manufactured under a DOT specification are accomplished as set forth in 49 CFR part 173, as amended.

f. ** Inspection, hydrostatic tests, and life limits for portable fire extinguishers are accomplished as set forth in 46 CFR sections 71.25 and 162.028, as amended.

g. Pressure vessels manufactured under MIL-SPEC are maintained in accordance with the applicable military specifications.

h. Foreign manufactured pressure cylinders are maintained in accordance with the applicable foreign manufacturer's specifications.

i. Pressure cylinders not manufactureD under DOT, foreign or U.S. MIL-SPEC are maintained in accordance with the applicable aircraft manufacturer's specification.

j. Life-limited parts are replaced as set forth in the applicable specification, type certificate data sheet, or other documents approved by the Administrator for each engine and/or propeller.

k. Life-limited parts are replaced as set forth in the applicable specification, type certificate data sheet, or other documents approved by the Administrator for each engine and/or rotor.

NOTE: Subparagraphs b, c, and e through k are, options selected to fit a particular certificates holder's operation.

1. Issued by the Federal Aviation Administration

2. These Operations Specifications are approved by direction of the Administrator.

Principal Maintenance Inspector

3. Date Approval is effective: MM/DD/YY Amendment No.: _____

4. I hereby accept and receive the Operations Specifications in this paragraph.

_____ _____ _____
Signature Title Date

Effective Date:

D71-3 CERTIFICATE NO.:

FAA Form 8400-8 (10-90)